UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/925,261	08/09/2001	Steven Niewiedzial	105577	4203

23490 7590 07/06/2004

JOHN G TOLOMEI, PATENT DEPARTMENT
UOP LLC
25 EAST ALGONQUIN ROAD
P O BOX 5017
DES PLAINES, IL 60017-5017

EXAMINER	
MCHENRY, KEVIN L	

ART UNIT	PAPER NUMBER
1725	

DATE MAILED: 07/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/925,261	NIEWIEDZIAL ET AL.
	Examiner	Art Unit
	Kevin L McHenry	1725

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 June 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niewiedzial (U.S.P. 5,565,020) in view of Van Tongeren (U.S.P. 2,039,692).

Niewiedzial teaches a fluidized catalytic cracking process in which hydrocarbon feedstock and solid catalyst particles are fed into a reaction conduit to form a mixture, the mixture is induced into a swirl by passing through tubular swirl arms and into a gas recovery conduit and separation vessel, and the mixture is then fed directly from the gas recovery conduit to a cyclone. Stripped catalyst particles and gases are collected from a stripping zone in the separation vessel. The swirl arms curve about an axis that is parallel to the reaction conduit and the openings of the swirl arm define a swirl direction toward the outer of the cyclone. The cyclone has a centrally disposed gas outlet (see U.S.P. 5,565,020; particularly Figures 1-5; column 1, lines 13-26; column 4, lines 34-67; column 5; column 6, lines 1-40).

Niewiedzial does not teach that the cyclone induces the mixture to swirl in a second direction that is counter to the first direction induced by the swirl arms.

Van Tongeren teaches a process for separating particles from air in which a cyclone is designed so that it induced a swirl in a direction counter to the first swirl direction of the mixture. Van Tongeren teaches that this process is highly efficient at

separating the particles and has the same efficiency as a very large direct-type cyclone while having a lower resistance (see U.S.P. 2,039,692; particularly Figures 7-8; column 1, lines 17-33; column 4, lines 28-45).

It would have been obvious to one of ordinary skill in the art at the time that the applicant's invention was made to have modified the process of Niewiedzial by the teachings of Van Tongeren. One would have been motivated to do so in order to provide a cyclone that is highly efficient at separating the particles and has the same efficiency as a very large direct-type cyclone while having a lower resistance, as taught by Van Tongeren.

3. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niewiedzial (U.S.P. 5,565,020) in view of Syred et al. (U.S.P. 4,634,456).

Niewiedzial teaches a fluidized catalytic cracking process in which hydrocarbon feedstock and solid catalyst particles are fed into a reaction conduit to form a mixture, the mixture is induced into a swirl by passing through tubular swirl arms and into a gas recovery conduit and separation vessel, and the mixture is then fed directly from the gas recovery conduit to a cyclone. Stripped catalyst particles and gases are collected from a stripping zone in the separation vessel. The swirl arms curve about an axis that is parallel to the reaction conduit and the openings of the swirl arm define a swirl direction toward the outer of the cyclone. The cyclone has a centrally disposed gas outlet (see U.S.P. 5,565,020; particularly Figures 1-5; column 1, lines 13-26; column 4, lines 34-67; column 5; column 6, lines 1-40).

Niewiedzial does not teach that the cyclone induces the mixture to swirl in a second direction that is counter to the first direction induced by the swirl arms.

Syred et al. teach a process for separating particles and gases in which a secondary chamber induces a swirl direction that is counter to the swirl direction of a first chamber. Syred et al. teach that this allows improved grading of the particles by size (see U.S.P. 4,634,456; particulary Figures 5a and 5b; column 1, lines 6-17, 32-51, 57-58, 67-68; column 2, lines 1-6; column 4, lines 7-28).

It would have been obvious to one of ordinary skill in the art at the time that the applicant's invention was made to have modified the process of Niewiedzial by the teachings of Syred et al. One would have been motivated to do so in order to provide a separation chamber that allows improved grading of the particles by size, as taught by Syred et al.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kemp (U.S.P. 4,482,451) is cited of interest for illustrating the state of the art in FCC reactor design.

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Terminal Disclaimer

6. The terminal disclaimer filed on 2 June 2004 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of S.N. 09/925,275 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Response to Amendment

7. Upon carefully reviewing applicant's amendment filed 2 June 2004, the examiner acknowledges the amendments to claims 1, 8, and 16. The former double patenting rejection and 112 rejections are withdrawn in view of applicant's amendments.

Response to Arguments

8. Applicant's arguments filed 2 June 2004 have been fully considered but they are not persuasive.

The applicant argues that the swirl of gas and particles induced by the swirl arms of the Niewiedzial process could not maintain a swirl in the gas recovery conduit. The applicant argues that because gas would rise after it exits the swirl arms and then would have to descend to enter the inlet for the gas recovery conduit, that the continued

swirling of the gas through the gas recovery conduit "would have even less likelihood". The applicant argues that the ascent and subsequent reversal of direction would cause a disruption to the swirling motion. This argument is unpersuasive because the applicant is arguing that continued swirling of the gas is unlikely rather than non-existent. The applicant has not provided proof that the arrangement taught by Niewiedzial would not result in continued gas swirling for gas in the gas recovery conduit. It should be further noted that descending gas in the Niewiedzial process would have to descend around the shroud 56 of the gas recovery conduit, which provides an annular space for the gas to descend through, and that this gas would encounter fresh gas that is exiting from the swirl arms.

The applicant also argues that because Niewiedzial does not teach continued swirling through the gas recovery conduit, there is no motivation to combine Niewiedzial with Van Tongeren or Syred et al. As noted above, the applicant has not shown that Niewiedzial would not have a continued swirl through the gas recovery conduit. As noted in the action above, both Van Tongeren and Syred et al. provide motivation to combine by teaching that their processes provide efficient or improved separation of particles.

The applicant also argues that Syred et al. suggest that some catalyst particles would be excluded from the second chamber, or cyclone, because of grading particles by size. This process already occurs in the FCC process when gas exits the swirl arms and heavier particles fall to the bottom of the separation vessel 42 before entering the gas separation conduit 52.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin L McHenry whose telephone number is (571) 272-1181. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin McHenry

Kevin McHenry

Kiley Stoner AU 1725

Kiley Stoner 7/1/04